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**MAKING THE INFORMATION MANAGER (G6/J6):
LEVERAGING INFORMATION MANAGEMENT TO ACHIEVE
INFORMATION DOMINANCE**

BY

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**MAKING THE INFORMATION MANAGER (G6/J6): LEVERAGING INFORMATION MANAGEMENT TO
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ABSTRACT

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The three primary communications disciplines offered to signal officers by the U.S. Army Signal Corps separately do not meet the educational and training needs required of the G6/J6 Information Manager to support future doctrine. In that context, should the U.S. Army Signal School's institutional training and educational programs for its three primary officer disciplines; Basic Branch 25, Functional Area 24 and Functional Area 53, be restructured in order to provide signal officers the proper tools necessary to become an effective G6/J6 Information Manager; supporting the complex and vast informational requirements of the future warfighter? The Army Signal Corps face tremendous challenges in educating, training and aligning the proper skill-sets required of its officers to successfully assist the Army and the joint community in meeting Joint Vision 2020 objectives in information technology. Developing effective, confident and skilled Army Information Managers is essential in ensuring not only Army, but Joint warfighters as well achieve and enjoy information dominance across the entire spectrum of conflict. In the draft version of the new FM 6.0, Command and Control, the Army's information management function is assigned to the G6 (Army Signal Officer). To properly fulfill the roles and functions of the G6/J6, it is my belief that Signal Officers must be trained and educated in a cross-section of skills pulled from each of the three specific signal disciplines. The future G6/J6 Information Manager must be multi-talented, skilled and educated not only in the installation, operation and maintenance of traditional communications systems, but also proficient in tactical operations, intelligence and information systems technologies — including data network engineering and computer network and system design.

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MAKING THE INFORMATION MANAGER (G6/J6): LEVERAGING INFORMATION MANAGEMENT TO ACHIEVE INFORMATION DOMINANCE

The three primary communications disciplines offered to signal officers by the U.S. Army Signal Corps separately do not meet the educational and training needs required of the G6/J6 Information Manager to support future doctrine. In that context, should the U.S. Army Signal School's institutional training and educational programs for its three primary officer disciplines; Basic Branch 25, Functional Area 24 and Functional Area 53, be restructured in order to provide signal officers the proper tools necessary to become an effective G6/J6 Information Manager; supporting the complex and vast informational requirements of the future warfighter?

The Army Signal Corps face tremendous challenges in educating, training and aligning the proper skill-sets required of its officers to successfully carry out their roles and responsibilities in meeting Joint Vision 2020 objectives in information technology. Developing effective, confident and skilled Army and Joint Information Managers is essential in ensuring not only Army, but Joint warfighters as well achieve and enjoy information dominance across the entire spectrum of conflict.

In the draft version of the new FM 6.0, Command and Control, the Army's information management function is assigned to the G6 (Army Signal Officer). To properly fulfill the future roles and functions of the G6/J6, Signal Officers must be trained and educated in a cross-section of skills pulled from each of the three specific current structured signal disciplines. The future G6/J6 Information Manager must be multi-talented, skilled and educated not only in the installation, operation and maintenance of traditional communications systems, but also proficient in tactical operations, intelligence and information systems technologies — including data network engineering and computer network and system design. Traditional legacy communications and information systems requires the G6/J6 to concerned his or herself with primarily easy to manage stand-alone and stovepipe voice and data systems, where information sharing is a structured and not fully automated process. The G6/J6 of the future must also leverage the future capabilities of integrated networked computer hardware, software, virtual tools and emerging information technology systems.

Whatever training, educational and force structure challenges created by training future signal officers in a cross-sections of the appropriate skills from each of the three current signal disciplines can be offset by the potential benefits provided to the theater level warfighter through a better skilled signal officer who is specifically trained and educated to render knowledge based advice and counsel in the art and science of information management.

SHAPING THE VISION

The unrelenting avalanche of technology combined with the continuous ability to transport data at light-speed has created an information environment not seen previously. The future information environment is made-up of the sum total of all the individuals, organizations, and systems that collect, process, or disseminate information, including the information itself.¹ Joint Vision 2020, the Department of Defense (DOD) view of the future military environment and the Signal Vision, the United States Army Signal Regiment's Vision, both envision an expansive information network capable of providing the connectivity and throughput for each of the elements listed from above that impact the warfighter's environment.

INFORMATION MANAGEMENT AND JOINT VISION 2020

Joint Vision 2020 (JV2020) looks at information and information technology as primary enablers that will revolutionize and dramatically affect the way the United States military conducts military operations in the future. JV2020's stated goal is to achieve what is being termed information superiority -- the capability to collect, process, and disseminate an uninterrupted flow of information while exploiting or denying an adversary's ability to do the same. Information Superiority is achieved when friendly forces have the information necessary to achieve operational objectives.² To gain maximum benefit and utility from any form of information superiority, it must be effectively translated and organized into meaningful knowledge and timely decisions. An enabler to the process of insuring the warfighters make knowledgeable and timely decisions is the concept of information management. The process of timely information turnaround facilitates the concept of decision superiority – arriving at and implementing faster and better decisions than an opponent can react to those decisions, or at a pace that allows the force to react to changes and accomplish its mission.³ At its most basic level, decision superiority gives warfighters the ability to make decisions inside an adversary's decision cycle. The information manager will be instrumental in assisting the warfighter in this vitally important and special process that will lead to information superiority, then to decision superiority. The type and structure of training received by future information managers will be a major factor in our ability to realize the goals of JV2020.

INFORMATION MANAGEMENT AND SIGNAL VISION

The stated Vision of the U. S. Army's Signal Regiment is to establish a single Communications and Information Systems structure that provides reliable and protected communications that extends the Global Information Grid (GIG) to commanders, staff and

soldiers, in order to achieve "knowledge dominance" under any conditions in the battle space.⁴ Within the construct of this vision, the Chief of Signal, as part of the Signal Regiment's Strategic Plan, lists several goals that the Signal Regiment must achieve in order to fulfill the vision articulated above.

The first of these goals is to connect the Communications and Information Systems (C&IS) infostructure to the global information grid through multiple linkages including satellite, terrestrial, and various Warfighter platforms across the area of operations. The second is to develop a culture that ensures the Signal Officer, as the commander's principal advisor for, Command, Control, Communications and Computers (C4), and Information Systems, is constantly joined at the hip of the commander, assessing the impact of the fight or maneuver on command and control (C2) and providing greater clarity and resolution to the commander's battlefield visualization. Next, as leaders access the information infostructure through the GIG, it will give leaders the ability to construct synergistic units that transcends echelons, functional and geographic areas, military and commercial sectors, and national or international barriers. Commanders will command and control forces using collaborative planning throughout all phases of a campaign, including mobilization, deployment, engagement and redeployment, while on the move. Fourth is to reduce the ratio between signal supporter and shooter on the battlefield while increasing capabilities and support to the warfighter. Ratio reduction is accomplished primarily through the complete networked interoperability of the GIG, ranging from strategic to tactical levels of operations, and also through the economies gain from equipment downsizing due to the continuous ability to rapidly move large quantities of information consisting of voice, data, and video, both within and out of the area of operations. Lastly, expand the role of Network Operations by integrating Communications and Information Systems across the network and use information dissemination management to enable the translation of information into Knowledge Dominance, insuring information reaches the right decision maker at the right time.⁵

The accomplishments of the above objectives are an enormous and ambitious undertaking, but entirely necessary. It will take the signal regiment a substantial investment in terms of time, money, personnel and training. It will also take the confidence and support of the warfighter to continually emphasize the importance of achieving those goals. Although the investments may be substantial, it is non-the-less extremely necessary if the signal regiment is to help move the Army closer to its goal of achieving and maintaining information dominance over a given adversary.

The Army is not in this alone, the accomplishment of the preceding goals, must also have "Joint" buy-in. The necessity to share scarce resources, the joint manner in which we will fight in the future, and the synergistic effect of being networked are in my opinion, positive outcomes, and if embraced, will foster the seamless integration and compatibility with other service systems in the joint environment, insuring the Army and our entire military are well postured to gain and maintain information dominance.

On the surface the Signal vision may seem as though it is focused entirely on Army communications and information systems and procedures, but under closer investigation, you will find that the vision espoused by the Chief of Signal is in full support of joint and combine doctrine.

The Army generally acts as the executive agent for joint tactical communications in the theater of war, due mostly to the overwhelming and preponderance of Army communications assets normally available throughout a theater of operations. The Theater's Joint Force Commander normally develops plans that organize Joint and Service organic and component tactical communications systems into interoperable and compatible theater networks to support their mission. At the theater level, the Theater Army Communications Command has operational control over the signal organizations supporting the Theater Army and its component commands. While in a theater of war, the Theater Army Communications Command is responsible for all in-theater Army communications and normally provides a large proportion of people and assets to the Joint Force Commander's Joint Communications Control Center (JCCC), the overall controlling communications element in theater. The Theater Army Communications Command would also operate and maintain in-theater Army DCS and joint facilities that are, in turn, under the management and control of the Defense Information System Agency Area Communications Operations Center.⁶

Just as a network is a group of interconnected systems linked together to share information⁷, the goals listed above can be viewed as a group of interconnected ideas that are linked together in such a manner that the accomplishment of one goal leads to or effect the fulfillment of the next. Each individual goal in and of itself can be accomplished independently of the next, but linked, intended or not, will expedite the realization of the vision and be an enabler of information dominance vice an inhibitor.

ACHIEVING INFORMATION DOMINANCE—THE CHALLENGES FOR THE G6/J6 INFORMATION MANAGER

The environment in which the Army warfighter must operate is overwhelmingly information intense. To be an effective manager of information, one must first understand the environment

and requirements of the supported warfighter. In the information saturated world of today, several key factors must be clearly understood and considered when developing the proper framework in which to advise and assist the warfighter in the execution of his duties and responsibility.

The warfighter's environment now consists of such factors as a reduced force size, greater mobility, considerations against asymmetric threats, rapid force projection, split base and reach back operations, support of ad hoc military and civilian structures, the ability to mass effects without massing forces, Joint and Coalition warfare, and increased threats to networks. The warfighter's ability to impact those factors is enhanced through the use of network centric warfare. Network centric warfare enables a warfighter to exercise greater command and control and awareness of forces across the battlefield.

BATTLESPACE AWARENESS

The role of the information manager as a signal function continues to emerge as new tactics; techniques and procedures are developed to contend with emerging information and network centric doctrine. The real challenge facing the new information manager is the true identification of roles and missions required by the warfighter and developing and obtaining the necessary educational and functional experience needed to accomplish those tasks. One monumental task awaiting the information manager is assisting the warfighter to achieve greater battlefield (battlespace) awareness.

Battlespace awareness, results from the fusion of key elements of information that describe or characterize the battlespace. The key elements are primarily explicit information (e.g., position of forces, geography, and weather). This type of information needs little interpretation and usually can be communicated quickly and easily. The difficulty comes in placing the information in a larger context and understanding its implications. Sensor entities are key contributors to battlespace awareness. Shared battlespace awareness is fundamentally a network-centric capability. In contrast, battlespace knowledge consists of tacit information. Tacit information requires interpretations. While supporting facts can be easily transferred, the underlying organizing logic can seldom be transferred quickly and easily. Tacit information includes capabilities and tactics of an adversary, local customs, and intent. Consequently, battlespace knowledge should be viewed as a people-centric capability in the sense that knowledgeable people play a key role in developing, processing, and communicating tacit information.⁸

To overcome these challenges, information management training and education must be capable of meeting the future needs of the Signal Corps and ultimately the Army's objective force. The signal community, by its very nature, is the primary controller and operator of military information conduits—the means through which information is actually transferred. To truly satisfy this new approach to seeing the battlefield, the education and training of the Army G6/J6 signal officer becomes paramount in meeting the strategic vision of the Army and its Signal Corps and JV2020.

NETWORK CENTRIC WARFARE

The impact of technology throughout our military has not only spurred a significant improvement in equipment capabilities, but technology has also impacted the way we employ and control forces now and in the future. Enhancing the warfighter's ability to employ and control forces is the nexus of network centric warfare – the sum total of information networks comprised of systems of systems which are interconnected to the point that information is supplied, shared and available at any point within the network, regardless of when and where needed. The C2 challenge for the warfighter, thus his information manager, is turning the enormous quantity of available data into manageable, useful and timely information. Deciding the shape, size and quantity of information is the critical first step a theater warfighter must take in successfully commanding and controlling a force.

Proof of the true power of network-centric operations is evident from the operational experience, as it exists with tactical data links. In an experiment comparing the operational performance of Air Force F-15Cs performing counter air operations with and without data links, the kill ratio of those Air Force systems increased by over 100 percent with network-centric operations. This increased combat power resulted from the significantly enhanced battle-space awareness that was provided to the pilots operating with tactical data links. Components of battle-space awareness that made this possible included weapons loading status of the blue force, real-time position of the blue and red force, and status of blue engagements, resulting in a significantly improved capability for observing, orienting, deciding, and acting.⁹

Although the use of data links as described above enhanced and improved decision-making capabilities, in another proof of concept conducted by the Army at the National Training Center during the 4th Infantry Division's Division Capstone Exercise (DCX I), demonstrated the continual need for concentrated training and well defined operational procedures. This was primarily the first time such a large number of Army information technology (IT) systems were networked in a tactical situation. Although successful, the exercise helped to identify broader

training and procedural issues than previously expected. The Tactical Internet (TI), the primary delivery system, particularly at brigade and below interjected complexities of interdependencies that were not well understood. A lack of a mature and robust systems architecture severely hampered the ability to plan, manage and troubleshoot the communications network and its component systems. Immature performance indicators and diagnostic tools were inadequate to identify problems areas early and the resulting cascading effects often masked basic causes.¹⁰

Network Centric Warfare derives its power from empowering all the decision makers in the battlespace rather than just a few. Complexity and battle tempo of the operation will force the use of the network in order to facilitate command and control. The objective of network centric warfare is to get every possible asset into the information mix all at the same time, resulting in a much broader area of influence and increasing the probability of accuracy—more elements confirming the same data from different points of view. Network centric warfare enables the accurate engagement of numerous high-value targets simultaneously giving the warfighter the advantage of surprise and shock that can bring a situation to a conclusion far more rapidly than an attrition-based approach.

As the concepts of network-centric warfare are applied to the management of battlespace information, I surmise that the vast majority of future warfighters will be as knowledgeable concerning the battlespace of the future, more so than even the best-informed personnel and experts of today. In the future we can expect tactical level commanders will have as great an understanding of both the big picture and the local situation than operational level commanders currently have today.¹¹ Seeing a common picture of both the friendly and enemy force array combined with the aggregate of other systems will lead to the warfighter achieving information superiority (dominance) over an adversary, ultimately resulting in the adversary's defeat.

In the attempt to gain information superiority over an adversary, great care must be taken to make sure that what is provided is actually useful information, because the potential still exists for information overload. The information manager will play a key role in insuring the proper management tools and procedures are in place to prevent such an overload. To actually achieve battlespace knowledge, and ultimately dominance, access to management tools and expertise will be required. What is valuable information and what is considered distractions depends mostly upon what the managing element does or is supposed to do. To produce a network-centric fighting force capable of overpowering an adversary through rapid maneuver and battlefield dominance, one of the challenges will be to develop a greater understanding of informational and situational needs and also to provide the necessary education and training to deal with the proliferation of information.¹²

KNOWLEDGE MANAGEMENT

If you believe that “knowledge is power,” then the key to maintaining a marked advantage over a potential adversary is to gain and use superior knowledge to your benefit and deny the enemy essential knowledge of the battlefield. A commander will derive power from being able to successfully manage and control key elements of knowledge as it relates to a particular environment or culture. The concept of knowledge management combines the elements of information, technology, processes and individual and organizational learning into a framework in which the synchronization of each element facilitates the creation of knowledge.

The connection between information and knowledge management is that knowledge is constantly being converted by individuals into many different forms of information, i.e., e-mails, memos, reports, and briefings; while acquiring information from others to improve their knowledge. This constant conversion of information into knowledge and knowledge into information is necessitated by the fact that commanders or warfighters cannot always share their knowledge face-to-face due to constraints involving personal time and attention as well as geographic and distance factors.¹³

Using the knowledge management philosophy of getting the right information to the right people at the right time in-order-to make informed decision requires an understanding not only of the pertinent technical issues but also of human cognitive processes and capabilities. Once the information is received it must make sense and be understood to be of use. The concept of knowledge management and insuring information makes sense are very important for future military applications. Getting the right information to the right people at the right time is paramount to Joint Vision 2020 and the concept of network-centric warfare, bringing sensors, shooters and military decision makers together on a shared network to improve awareness, speed of command, survivability, tempo, lethality, and synchronization.¹⁴

The continued surge of information technology investments over the past few years has significantly increased the amount of data and information the commander has available, thereby increasing the complexity of decision-making. As this complexity increases, we invest in more information technology to help solve the problem, thereby further increasing the amount of data and information, and further increasing, in turn, decision making complexities. This is the environment in which the information manager must thrive and successfully operate.

MANAGEMENT, CONTROL, AND COMMUNICATIONS SYSTEMS

The merging of communication and information system has led the way to greater battlefield awareness and information accessibility across the entire network. Understanding

how to harness the abundance of data and turn it into usable information while also properly managing the various communications and information systems discussed earlier—in order to provide the Army warfighter the right information to make rapid decisions, will require a Signal Officer that is formally trained, educated and hopefully experienced in the art and science of managing information.

Joint Publication 0-2, Unified Action for the Armed Forces (UNAAF), describe command and control as the most important function undertaken by a Joint Force or Theater Commander. Command and control is the means by which a commander synchronizes his force through the exercise of authority and direction over assigned and attached forces in order to achieve unity of command and unity of effort; tying together all operational functions and tasks across all levels of war and echelons of command across the range of military operations.¹⁵

Advances in information technology and communications has provided commanders at all levels, from tactical to strategic, a tremendous situational awareness capability, enhancing their ability to make sound and timely decisions and execute them successfully. For a commander to fully achieve unity of effort and synchronization he must adhere to the tenets of command and control, the most paramount is information management.

Information Management requires the efficient use of people, procedures and systems to keep commanders and their staff from being overwhelmed by information. Identifying, requesting, receiving, and tracking and disseminating required information are key to making timely and informed decisions. The commander's critical information requirements is essential to developing the criteria of an information management plan that address priority, flow, protection, filtering, fusion, and common operational picture criteria. To maximize the effectiveness of information systems require knowledgeable users that understand the information criteria as well as the need for both, system and information protection.

The focus for the Army's tactical communications and information system network is the Tactical Internet. Each digital component that makes up the C&IS network either plug directly into the tactical internet or feed indirectly into it. The tactical internet combines multiple data components and subsystems together and displays information in a hierarchical form from all sources into a comprehensive picture. This collection of subsystems is referred to as the Army Battle Command System (ABCS).

To perform the information management function with any thought of success and benefit to the warfighter, the information manager, must clearly know and understand the way information is moved and processed around the battlefield. Not only must the information manager know Army systems, he must also have a deep understanding of communications and

information systems from other services. All of these systems when deployed will be a part of the Theater's overall communications and information network, making it essential that the G-6 information manager have at-the-least a basic technical knowledge and operational understanding of other joint systems. The Army's primary communications conduit that will enable information to speed across the battlefield is the tactical Internet. The United States Navy and Air Force have both used compatible data systems at the operational and tactical levels for some time. Inherently joint, the Advance Tactical Data Links (ATDL) Program used both by Navy and Air Force primarily to communicate with planes and compatible ships are the key conduit by which data is passed. The program is comprise of three ATDL Links, Link-11, 16, and 22, all compatible with Joint Message Standard (TADIL-J). Link 16 is the Navy and Air Force's primary tactical data link. Link 11 is the common tactical data link for all U.S. Navy and allied ships not equipped with Link-16. Link 22 is programmed as the next-generation U.S. and NATO common tactical data link and will replace Link 16 prior to year 2020.¹⁶ Additionally, the Automated Digital Network System (ADNS) used by the Navy automates the routing and switching for tactical through strategic C4I data via TCP/IP networks, linking deployed battle group units with each other and with the Defense Information System Network (DISN) giving it virtually world-wide access.¹⁷

Most people have used or at least have a fair understanding of the commercial internet. With the exception of a few additional operational considerations, the concept for the tactical internet is basically the same as for the commercial internet. The majority of the Army's tactical internet consists of wireless transmission (RF) components due to the requirement of communicating and providing information to every echelon of command and individual platform on the battlefield at the same time, just as we discussed with the Navy and Air Force systems. At the same time the information is expected to be accurate and reliable, indicating the need for some form of information assurance and security.

Information assurance - trusting the icons, is the single most fundamental challenge facing the warfighter and the network provider. Until information assurance technology proves itself by protecting 100% of the data 100% of the time, warfighters will continue to lack the total trust and confidence needed to risk the life of service personnel solely on digital information received through the tactical internet.

The ABCS system, consisting primarily of three components, allows access to and connects to communications hardware that is capable of spanning strategic, operational and tactical levels of operation. First, the Army Global Command and Control System (AGCCS), is the Army's strategic application of the ABCS triad, each service having its own version.

Secondly, the system operating throughout the operational and tactical echelons connecting the corps with both internal and external units is the Army Tactical Command and Control System (ATCCS). ATCCS is comprised of five battlefield-operating subsystems; the maneuver control system (MCS), the advanced field artillery tactical data system (AFATDS), the all source analysis system (ASAS), the combat service support control system (CSSCS), and the air and missile defense workstation (AMDWS). Last but certainly not the least, the newest and most complex tactical real-time system that provides situational awareness and command and control data with graphic display is the Force XXI Battle Command Brigade and Below System (FBCB2). FBCB2 gives the tactical operator a much better set of eyes and ears, greatly enhancing situational awareness by identifying in real-time your location, the location of my friends, and the location of the enemy. FBCB2 generates a continuous flow of information that is displayed on a single platform, providing command and control and situational awareness data to the lowest tactical echelon on the battlefield.¹⁸

THE DISCIPLINES

It is important to gain an appreciation for the training, education and experience level required of communications officers in their current role of supporting the warfighter and also identifies any required changes needed to service future warfighters. Signal officers are trained in one of three primary disciplines within the communications field, Signal Corps Branch (BR) 25, Information Systems Engineering Functional Area (FA) 24, and Information Systems Management Functional Area (FA) 53. The specific criteria—intent, length and curricula to produce an Army signal officer with the roles and responsibilities to fulfill the needs of today and tomorrow's signal corps differ across each of the signal regiment's three primary disciplines. Branch 25, Functional Area 24 and Functional Area 53, signal disciplines are all important and all have some basic communications commonality between them, but once passed the most basic level, you find a sharp divergence in respect to training areas of concentration. As currently organized, these three signal disciplines are limited in their ability to separately generate the overall educational and training outcome needed to fulfill the anticipated requirements of the information manager of the future, but if looked at holistically, merging the key and essential curriculum items from each discipline, will produce a better trained and educated officer to fulfill those future needs.

Functional Area 53

Functional area 53 officer skills concentrate on the management of computer information systems and networks deployed on the battlefield and primarily serve as the principal information technology staff officer at brigade level and higher. Information Systems Management is the only area of concentration associated with FA 53. It is key to realize that the majority of these officers are generally recruited from areas of concentration other than a communications background.

According to U.S. Army Personnel Command (PERSCOM), of the more than 3800 active duty signal officers, only 52 officers with signal background are trained as a FA 53. The overwhelming majority of FA 53 officers are from backgrounds other than signal. (See Table 1.) The Information System Management course has a current technology and application specific flavor to it that prepares officers for positions that require knowledge in computer programming, configuration management, local area network system administration, email administration, database administration, web design, network security or computer helpdesk management at all organizational levels to include multinational, joint and Service agencies.

	BR 25	FA 24	FA 53	TOTAL
Colonel	123	2 (2)	23 (4)	148
Lieutenant Colonel	363	42 (14)	129 (21)	534
Major	608	81 (38)	215 (27)	904
Captain	1131			1131
Lieutenant	1092			1092
TOTAL	3317	125 (54)	367 (52)	3809

TABLE 1. (SIGNAL OFFICERS BY RANK & SPECIALTY) ¹⁹

() = Number of officers with previous BR 25 experience as CPT/LT.

As a result of this specific training and educational focus, FA 53 officer are responsible for advising their commander and staff on computer information system policy, technical, and engineering matters. Although the FA 53 plans and manages the integration of hardware, software and data communications at the user interface level, his specific mission focus of computer systems local area networks, and with his often limited communications oriented background, in my opinion, disadvantages him in his ability to provide broad management coverage to the warfighter and satisfy issues associated with the complexities of network centric operations.²⁰ Clearly the future G6/J6 Information Manager must personally possess specific

attributes of the FA 53 officer to be truly effective, but the issue remains as to which of these attributes once exported will enhance the basic needs of the future information manager?

FA 53 Course Core Curriculum:	
ISOLCourse (10weeks)	ISM Core Curriculum (20 weeks)
Introduction to the Regiment	Cisco Academy 3 rd & 4 th
Semesters	
Basic Electronics	NT Enterprise 4.0
Telecomm Concepts	Exchange Server 5.5
ECB Communications	VTC/BVTC Design Concepts
EAC Communications	Solaris Admin
Automation Training:	System Admin/Ntwk Mgr Security
Hardware	Database Design/Development
Operating Systems	Programming Logic
Cisco Academy 1 st Sem	Programming w/VB 6.0
Cisco Academy 2 nd Sem	Web Design and ASP
Windows 2000 Professional	Systems Analysis Design
Window 2000 Server	SQL Management
Introduction to Unix	Seminars
IASO Security Course	

TABLE 2 (FA 53 CURRICULUM).

Functional Area 24

Functional Area 24 officers have the responsibility for developing and planning the backbone of the Army's communication networks from tactical to strategic to sustaining base levels. Officers qualified in this functional area work in one of three sub-disciplines, Telecommunications System Engineer, Data Systems Engineer, and Information Systems Engineer—at the senior level only. To properly carryout the demands of this functional area requires the practical application of system engineering principles to plan, design and install tactical and non-tactical information systems and networks.

The primary goal of Telecommunications Systems Engineering Course is to teach the science behind the technology so that officers will understand how to evaluate existing and proposed communications system and architectures for optimization and cost effectiveness. This engineering discipline requires the application of electrical, electronic, telecommunications, and systems engineering theory and principles to design, develop, install, implement, integrate, test, accept, and upgrade telecommunications systems and networks while at the same time provide detailed engineering guidance and technical solutions to solve specific telecommunications issues.²¹

The FA 24 officer will typically work as a system engineer at echelons above corps signal battalions and brigades or system analyst at MACOM, joint, multinational or DOD level.

Unlike FA 53, nearly one half of FA 24 officers have communications as an initial area of concentration. Still, the majority of FA 24 officers are career field designated (CFD) from a discipline other than communications. According to U.S. Army Personnel Command (PERSCOM), out of a total of 125 officers holding the FA 24 designation, only 54 has a signal background (See Table 1). Just as in the case with FA 53, the FA 24 engineering specific and heavy analytical approach to communications severely constrains the officer's ability to also look broader in terms of overall network management. Although some officers do have general communications knowledge and experiences, their present requirement to continually focus on internal systems optimization severely detracts from what I see as a need to be more broad and flexible as an G6/J6 Information Manager; developing an enhanced situational awareness in order to manage the informational requirements of the unit.

FA 24 Course Core Curriculum:	
<u>ISOL Course (10 weeks)</u> <u>(20 weeks)</u>	<u>TSEC Core Curriculum</u>
Introduction to the Signal Regiment Models	Telecommunications Systems
Basic Electronics:	Data Communications
C Programming	Switching
Math for Networking	Network Operations and Management
Automation Training	:Information Assurance
Hardware	Network Design
Operating Systems	Legacy/Future Commo Systems
Cisco Academy 1 st Sem	Group Thesis Project
Cisco Academy 2 nd Sem	
Windows 2000 Server	
Introduction to Unix	
IASO Security Course	

TABLE 3 (FA 24 CURRICULUM).

Signal Branch 25

Signal Branch 25 (BR 25), the basic career field—is the primary communications discipline tasked with advising the warfighter on overall communications matters. To fulfill this task the signal officer is well grounded in troop leading skills as well as managerial and technical skills, including combined arms and signal support and coordination principles. Included in this package is practical experience in tactics, combined arms operations and the employment of direct and indirect fire weapons systems—experience initially gained through duty assignments at the company level as platoon leader, company executive and operations officer, signal battalion staff officer, company commander and as the Signal officer (S6) of combat arms, combat support and combat service support units.

Branch 25 officers receive a general education in signal operations at the signal officer's basic and career courses totaling 36 weeks. Officers receive instructions for the purpose of fulfilling the duties of commanding and managing signal units; planning coordinating and supervising signal activities and training; and providing advice and technical directions to commanders, staff and other C4 users, in both fixed and mobile configurations at all levels of operations—tactical, operational, strategic and sustaining base.

BR 25 Captain's Career Course Core Curriculum	
Command and Discipline	Joint/Echelons Above Corps Communications
Write to Persuade a Decision Maker	Joint Task Force Organization and Communications
Apply the decision making process	Signal Support to Theater Operations
Direct Unit Maintenance Operations	Defense Information Infrastructure (DII)
Integrate Critical Thinking Skills	Special Purpose Circuits
Identify fundamentals of tactics	Joint Network Planning
Leadership & Professional Skills	Echelons Corps and Below Signal Operations
Team Building	ACU Corps/Division MSE Network Planning and Manage
Problem Solving	Signal Staff Officer Operations
Repair local area networks	Duties of the S-6
Automation	Army Battle Command System (ABCS)
Plan a Local Area Network	Describe Tactical Internet system capabilities
Implement the Microsoft Windows NT Operating System	Signal Staff Officer Network Planning
Troubleshoot a Local Area Network (LAN)	Network Planning and Management
Fundamental of Tactical Communications	Network Resources and Management Tools
Multiplexing	Information Assurance and Information Protection
Switching	ISYSCON ATCCS, Lower TI Network,
Transmission Fundamentals	& WAN Management Platforms
Radio Wave Propagation	Intro to the ECB ATCCS and Lower TI Network
Satellite Communications Principles	Router Fundamentals and Routing Protocols
Fundamentals of Tactical and Strategic Networks	Introduction to Network Management
Information Systems Architecture	Simple Network Management Protocol
Fundamentals of InfoSystems Security	IP addressing and subnet mask review
	Introduction to CISCO View Application
	CISCOWORKS 2000 WAN Management Overview
	CISCOWORKS 2000 Network Management Applications

TABLE 4 (BR 25 CURRICULUM).

The BR 25 officer duties and responsibilities includes: planning and managing single channel radio systems; planning and managing echelon corps and below area communications nodes and networks; planning and managing echelon above corps area communications nodes and networks; planning and managing wire and fiber optic systems; planning, managing and directing a local area computer network (LAN); managing automation equipment; managing the implementation of information security measures; and providing signal support to non-signal units. Branch 25 makes up the overwhelming majority of officers within the signal regiment, comprising 97% of the total active duty commissioned signal officers managed by U.S. Army PERSCOM, (See Table 1). The execution of the duties and responsibilities require the proper balance between technical skills and the ability to understand the warfighter, and apply the appropriate tactical skills at the right moment. The BR 25 officer gained and developed these

skills through repetitive operational assignments and continuous practical experience in tactics, combined arms and signal support principles.²² Although somewhat limited in systems engineering and computer systems technology, the BR 25 officer due to the current education and training possesses at least a basic understanding of both. The BR 25 officer's overall understanding of the "big" picture establishes an excellent foundation to further build upon in creating the future G6/J6 Information Manager

MERGING FUNCTIONS

As the commander's principle advisor for C4I the G/S6 signal officer, inclusive of all signal disciplines, has had the implied task through the years of being the commander's informal information manager long before being officially designated through the implementation of FM 6-0.²³ Although the experience level of the G/S-6 may vary, depending upon the officer's grade and assignment experience, by virtue of having the most broad knowledge and responsibility for installing both the unit's communications and data networks, the BR 25 officer must be capable of visualizing the battlefield and determining how best to employ the complete array of signal assets. The BR 25 G/S-6 has come to know and understand the tactical situation and also understand both the enemy and friendly scheme of maneuver. But more importantly, by the very nature of his duties, the average BR 25 G/S-6 has worked along side the warfighter during every phase of planning and execution of an operation—learning the warfighter traits. By understanding the operational situation and through his unique clarity of the various communications networks and systems, the BR 25 officer can better recommend to the commander priorities for allocating critical communications resources, task organization and the assignment of missions to attached and subordinate signal elements. In executing his official duties, the BR 25 G/S-6 seem to be in the best all around position to advise the commander on all matters concerning command and control, communications, computers and intelligence (C4I) systems, including planning and directing all aspects of the unit's communication systems. Through my own personal on-the-job experience, the commander and warfighter, time and time again, relies heavily on the G/S-6 for just such expert advice and counsel.

Although FA 24 officers can function as G/S-6 of a unit, they are highly specialized and trained to concentrate the majority of their energies on maintaining the physical health and efficiency of signal communications networks and systems. The future information manager clearly requires some of the same course material currently offered to FA 24 officers to be effective, but the future information manager will find himself in operational settings that will

require a much broader perspective and base of knowledge than currently offered through FA24 training and education.

The Information System Management (FA 53) discipline sounds distinctly similar to that of the G/S-6 Information Manager. Regardless of the similarities in name, the two differ greatly, primarily through different mission focus and scope of responsibility. The FA 53, just like the FA 24 can also function as a G/S-6 of a unit, but with a specific focus on computer systems operations, the FA 53 may be at a disadvantage when advising the commander on other informational and communications functions within the unit—which will comprise the majority of the information required by the commander.

The closest career field to demonstrate the attributes of what the future information manager will require is Signal Branch 25 (BR 25). Albeit lacking some of the in-depth “hard” technical skills of a FA 53 or FA 24 officer, the BR 25 officer does have limited training in these two skills within his background. With limited “hard” knowledge in computer systems and engineering, combined with his expert skills in operations, communications and information systems makes the BR 25 officer a primary focal point in which to develop as the Army’s information manager. Merging key course material from FA 53 and FA 24 curriculums with BR 25 is the most logical next step in-order-to provide the future commander the best qualified information manager possible.

CONCLUSION

In the draft version of the new FM 6.0, Command and Control, the Army’s information management function is assigned to the G6 (Army Signal Officer). As the U. S. Army Signal Corps (Regiment) posture to support a future knowledge-based force, information will emerge as a significant element of combat power. Maintaining the network and insuring information, is properly distributed in order that the warfighter receives the right information, in the right amount, at the right time, delivered to the right location will be the job of the G/S-6 signal officer—the new Information Manager.

Signal Officers must be trained and educated in a cross-section of skills pulled from each of the three specific signal disciplines to properly fulfill the roles and functions of the G/S-6. The future G/S-6 Information Manager must be multi-talented, skilled and educated not only in the installation, operation and maintenance of traditional communications systems, but also be proficient in tactical operations, intelligence and information systems technologies — including data network engineering and computer network and system design. To truly appreciate the enormous breadth of responsibility that will be levied upon the G/S-6 as they accept their new

role as Information Manager, one must only look at the curriculum of each of the three signal disciplines. The new world of information technology will require the Army's G6 information manager to operate across all three of the primary signal disciplines in order to fully meet the total information management requirements of the objective force. The power of network architectures joined together with a system-of-systems approach will make available to a commander the right information, in the right quantity, when and where needed. As the information manager learns and applies a systems way of thinking, individual decision making capability increases, thereby reducing decision-making complexity. The increased decision making complexity will drive the need for organization knowledge management systems. As new and improved information management processes are put into place, decision-making capability improves, thereby reducing decision-making complexity. It is the job of the information manager to make this process less complex and facilitate network centric warfare to enhance the future warfighter's ability to effectively command and control, playing a tremendous role in orchestrating the efficient and timely flow of information within the unit.

RECOMMENDATION

In analyzing the various academic course requirements offered within each of the three signal disciplines, it is clear that singularly, neither BR 25, FA 53 or FA 24 offers the total array of educational experiences needed to prepare a signal officer for the future role as information manager. Of the three signal disciplines BR 25 officer's course offers the curriculum that allows the widest base of knowledge in which to merge limited FA 53 and FA 24 course material—allowing further development of the training and educational tools necessary to become an effective G6/J6 Information Manager. As indicated, BR 25 course material, without modification, already provides officers an opportunity to gain limited knowledge and experience in both, FA 53 and FA 24 responsibilities. By expanding BR 25 curriculum and incorporating limited FA 53 and FA 24 course material will allow future G6/J6 Information Managers a much greater knowledge base from which to support the future warfighter. Specifically, expanding the Network Planning and Management Lesson currently offered to BR 25 officers by increasing the hours devoted to Information Assurance and Information Protection will provide a better background in the one area that will be a major concern to future warfighters. Next, incorporate into the BR 25 curriculum the 1st and 2nd semester of Cisco Academy training, just as in the two functional areas. Providing Cisco training to BR 25 officers will provide the G6/J6 officer a great understanding of key routing principles and standards to become a better manager of digital information and components.

In this era of doing more with less, there is still an important and necessary role for both FA 24 and FA 53 officers, but developing a BR 25 G6/J6 capable of conducting crucial information management functions at every level is truly an organizational necessity. Failure in this endeavor will significantly jeopardize the warfighter's ability to achieve information dominance.

WORD COUNT = 7331

ENDNOTES

¹ Chairman of the Joint Chiefs of Staff, Joint Vision 2020, America's Military: Preparing for Tomorrow (Washington, D.C.: U.S. Government Printing Office, June 2000), 8.

² Ibid

³ Ibid.

⁴ John P. Cavanaugh "Signal Regiment Vision Statement." Available from <<http://www.gordon.army.mil/cmdgrp/html>>. Internet. Accessed 14 August 2001.

⁵ Ibid.

⁶ Chairman of the Joint Chiefs of Staff, Doctrine for Command, Control, Communications, and Computer (C4) Systems Support to Joint Operations, Joint Pub 6-0 (Washington, D.C.: U.S. Government Printing Office, 30 May 1995), IV-4-IV-5.

⁷ Webster's II New Riverside Dictionary.

⁸ David S. Alberts, John J. Garstka, and Frederick P. Stein, Network Centric Warfare: Developing and Leveraging Information Superiority, 2nd Edition (Revised) (Washington, D.C.: CCRP Press, 1999), 100.

⁹ Alberts, 128.

¹⁰ Executive Summary, Heavy Axis Council of Colonels

¹¹ Ibid., 107.

¹² Ibid., 108.

¹³ Thomas H. Davenport and Donald A. Marchand, "Is KM Just Good Information Management?" National Post Online 24 July 2001; available from <<http://www.nationalpost.com/features/fpmasterng/072401stroy1.html>>; Internet; accessed 17 January 2002.

¹⁴ Staff Writer, "Information and Command and Control," Aerospace America, (December 2001), 48.

¹⁵ Chairman of the Joint Chiefs of Staff, Unified Action Armed Forces (UNAAF), CJCS Pub 0-2 (Washington, D.C.: U.S. Government Printing Office, 10 July 2001), III-13.

¹⁶ Department of the Navy, Vision-Presence-Power, Program Guide to the U.S. Navy, (Washington, D.C.: 2000 Edition), 88.

¹⁷ Ibid.

¹⁸ Dennis Steele, "Force XXI Gear: Tactical Internet and ABCS—The Biggies," *The Army Magazine Hooah Guide to Army Digitization*, (2001).

¹⁹ Numbers extracted from databases provided by U.S. Army PERSCOM, Signal Branch and U.S. Army, Office Chief of Signal (OCOS). Numbers are current as of November 2001.

²⁰ Department of the Army, Commissioned Officer Development and Career Management, Army Pamphlet 600-3 (Washington, D.C.: U.S. Department of the Army, 1 October 1998), 250.

²¹ Ibid. 220.

²² Ibid. 91-92

²³ Briefing delivered to the USAWC Signal officers during a visit to Carlisle Barracks by the U.S. Army Chief of Signal, Dec 01.

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